

I CLAIM:

1. A light emitting assembly comprising

a metal substrate providing an electrically insulating coating less than one thousand microns thickness;

a plurality of circuit traces on the electrically insulating coating providing terminals and conductive paths for placing light emitting elements in circuit, the terminals being of a metal compatible with metal droplet connections;

a plurality of light emitting elements having leads bonded to the terminals with metal droplets; and

a metal coating on the substrate in heat transmitting relation between at least some of the light emitting elements and the substrate transmitting heat from the light emitting elements to the metal substrate.

2. The light emitting assembly of claim 1 wherein the metal substrate is selected from the group consisting essentially of aluminum, aluminum alloys, magnesium, and magnesium alloys and the electrically insulating coating is an anodized layer.

3. The light emitting assembly of claim 1 wherein the electrically insulating coating is a cured thick film coating.

4. The light emitting assembly of claim 1 wherein the electrically insulating coating is a porcelain enamel.

5. The light emitting assembly of claim 1 wherein the electrically insulating coating is a plasma applied coating.

6. The light emitting assembly of claim 1 wherein the metal coating provides a shiny metal patch reflecting light from the light emitting element away from the substrate thereby increasing the reflectivity of the assembly and increasing the amount of light emitting from the assembly.

7. The light emitting assembly of claim 1 wherein the light emitting element includes a metallic lower surface and the metallic lower surface abuts the metal coating.

8. The light emitting assembly of claim 1 wherein the circuit traces and the metal coating are of the same material.

9. The light emitting assembly of claim 8 wherein the circuit traces and the metal coating comprise silver.

10. The light emitting assembly of claim 9 further comprising a clear finish over the metal coating thereby reducing tarnishing of the silver.

11. The light emitting assembly of claim 9 wherein the circuit traces and the metal coating are a mixture of silver and glass.

12. The light emitting assembly of claim 1 wherein the circuit traces are thin film traces.

13. The light emitting assembly of claim 1 wherein the circuit traces are thick film traces.

14. The light emitting assembly of claim 1 wherein the substrate comprises an area increasing undulating surface increasing the heat transmission capacity of the substrate.

15. The light emitting assembly of claim 1 wherein the metal droplet is a soldered connection.

16. The light emitting assembly of claim 1 wherein the metal droplet is a wire-bonded connection.

17. The light emitting assembly of claim 1 further comprising a resistor in thermal contact with the substrate in circuit with the light emitting element.

18. A light emitting assembly comprising

a metal substrate having a surface providing an electrically insulating coating less than one thousand microns thickness;

a plurality of circuit traces on the electrically insulating coating providing terminals and conductive paths for placing light emitting elements in circuit, the terminals being of a metal compatible with metal droplet connections;

a plurality of light emitting elements having leads bonded to the terminals with metal droplets;

a metal coating on the substrate positioned to reflect light away from the metal substrate thereby increasing the reflectivity of the substrate and increasing the amount of light emitting from the assembly; and

a clear finish covering at least part of the metal coating and reducing tarnishing thereof.

19. The light emitting assembly of claim 18 wherein the circuit traces provide the metal coating.

20. The light emitting assembly of claim 18 wherein the metal coating and the circuit traces are of the same silver based material.

21. A light emitting assembly comprising

a metal substrate having an electrically insulating coating less than one thousand microns thickness covering part of the substrate and providing at least one hole in the coating;

a plurality of circuit paths on the electrically insulating coating providing terminals and conductive paths for placing light emitting elements in circuit, the terminals being compatible with metal droplet connections; and

a plurality of light emitting elements having leads bonded to the terminals by metal droplets;

at least one of the light emitting elements being positioned over the hole in the coating in heat transferring relation with the substrate.

22. The light emitting assembly of claim 21 wherein the metal substrate exposed by the hole in the coating reflects light away from the metal substrate thereby increasing the reflectivity of the substrate and increasing the amount of light emitting from the assembly.

23. The light emitting assembly of claim 21 wherein the light emitting element includes a heat dissipating member juxtaposed to the hole in the coating thereby transferring heat from the light emitting element to the metal substrate.

24. The light emitting assembly of claim 23 wherein the heat dissipating member is a metal member and the metal member abuts the substrate through the hole in the coating.

25. A light emitting assembly comprising

a metal substrate having a surface providing an electrically insulating coating less than one thousand microns thickness;

a plurality of circuit traces on the electrically insulating coating providing terminals and conductive paths between the terminals for placing light emitting elements in circuit, the circuit traces comprising a quantity of silver effective to make the paths conductive, to make the terminals compatible with metal droplet connections and to reflect a significant amount of light away from the substrate; and

at least one light emitting element having leads bonded to the terminals with metal droplets.

26. A light emitting assembly comprising

a metal substrate having a surface providing an electrically insulating coating less than one thousand microns thickness;

a plurality of circuit traces on the coating providing terminals and conductive paths between the terminals for placing light emitting elements in circuit;

a plurality of light emitting elements having leads bonded to the terminals;

a shiny metallic area on the substrate for reflecting light from the light emitting elements away from the substrate thereby increasing useful light from the assembly and reducing energy absorption by the substrate; and

a clear finish covering at least part of the shiny metallic area and reducing tarnishing thereof.

27. The light emitting assembly of claim 26 wherein the shiny metallic area comprises a silver rich coating on the substrate.

28. The light emitting assembly of claim 27 wherein the circuit traces provide the silver rich coating for reflecting light from the light emitting elements away from the substrate.

29. The light emitting assembly of claim 26 wherein the metal substrate comprises a shiny light colored metal and the shiny metallic area comprises part of the metal substrate.